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We recommend the book as valuable to the student of physics and engineering, but as especially valuable to the student of pure mathematics, and as a book that will be useful to all teachers of the infinitesimal calculus.

W. F. OSGOOD.

HARVARD UNIVERSITY, 26 April 1898.

A Text-Book of Botany. By DR. E. STRASBURGER, DR. FRITZ NOLL, DR. H. SCHENCK and DR. A. F. W. SCHIMPER; translated by H. C. PORTER, PH.D. London and New York, Macmillan & Co. With 594 illustrations, in part colored. 8vo. Pp. x + 632. \$4.50.

In 1894 the 'Bonn Text-Book' appeared from the hand of the brilliant German botanist Strasburger, with the assistance of three of his collaborators. In this volume Strasburger prepared the chapter on external and internal morphology (132 pp.), Noll the chapter on physiology (125 pp.), Schenck that relating to cryptogams (104 pp.) and Schimper that on phanerogams (264 pp.). The success of this volume was so great that in but little more than a year a second edition was brought out, with some new matter and additional illustrations. About a year ago the welcome announcement was made that Dr. Porter, of the University of Pennsylvania, was bringing out a translation of this second edition, but its appearance has been much delayed, and the volume was not issued until early in April of the present year. The length of this delay is indicated by the date of the translator's preface, February, 1896, and accounts for the fact that some important additions to botanical science are not noticed in this otherwise very modern book. There is no reference to Harper's proof of the fecundation in the *Erysiphææ*, nor to the discovery of antherozoids in lower gymnosperms.

The volume in its German dress is so well known to botanists that it is quite needless to speak of its merits. Perhaps no man living is better prepared than Dr. Strasburger to undertake the presentation of the portion of the work which deals with the internal morphology of plants. Certainly no man has a better knowledge of the structure of the cell, and the many changes which it undergoes in constitu-

tion and form. This book, unlike many other text-books, is, in this chapter at least, authoritative.

The translation is good, and the publishers have spared no pains to make the type and printing all that could be desired, these being far more pleasant to the eye in the translation than in the original. The colored figures, also, are somewhat improved by a softening of the rather bright colors of the German editions.

The publishers announce an early issue of this work in two volumes, of about 300 pages each, to be sold separately, volume I. containing Strasburger's chapter on Morphology, and Noll's on Physiology, and volume II., Schenck's Cryptogams and Schimper's Phanerogams. This will be a great improvement, since it will enable the student of morphology and physiology to supply himself with the part relating to these subjects at much less expense.

CHARLES E. BESSEY.

SCIENTIFIC JOURNALS.

Journal of Physical Chemistry, April. 'Study of a three-component System:' by HECTOR R. CARVETH. A study of the freezing-points of lithium, sodium and potassium nitrate mixtures and their classification and interpretation according to the Phase Rule. The suggestion is made of the possibility of applying the freezing-point method to the analysis of mixtures of inorganic salts. 'Note on Thermal Equilibrium in Electrolysis:' by D. TOMMASI. The effect of the simultaneous action of an oxidizing and a reducing agent upon a substance capable of being oxidized or reduced. A mixture of electrolytic hydrogen and oxygen was allowed to act on various substances, as nitric acid, potassium chlorate, etc. The laws are deduced that when a substance is submitted to two equal and contrary chemical actions the reaction which evolves the most heat will take place in preference, provided always it can begin; and of two chemical reactions that one which requires less heat to start it will always take place in preference, even though it evolves less heat than the other reaction. 'Benzene, Acetic Acid and Water:' by JOHN WADDELL. An investigation of the distribution ratio of acetic acid in benzene and water as solvents.

'A Constant Temperature Device:' by HAMILTON P. CADY. A device for keeping up the circulation of water at a constant temperature. 'The Equilibrium of Stereoisomers, II:' by WILDER D. BANCROFT. A study of the change from one isomer into another due to the addition of one or more components. Reviews of books and journals.

American Chemical Journal, May.—'A Determination of the Atomic Weight of Praseodymium and Neodymium:' by H. C. JONES. The material for this work was obtained from the Welsbach Light Co., and was carefully purified and tested with the Rowland spectroscope. The sesquioxide was converted into the sulphate and the calculation made from this. The values obtained were for the Praseodymium 140.45, and for the Neodymium 143.6. 'Veratrine and some of its derivatives:' by G. F. FRANKFORTER. A careful study of this substance and some of its derivatives has shown that it is identical with cevadine. 'On the action of Hydrogen Sulphide upon Vanadates:' by J. LOCKE. Several sulphovanadates have been prepared by the action of hydrogen sulphide on vanadates heated in a combustion furnace. 'On the formation of Imido-1, 2-diazol Derivatives from Aromatic Azimides and Esters of Acetylenecarboxylic-acids:' by A. MICHAEL, F. LUHEN and H. H. HIGBEE. 'On the Oxide of Dichlormethoxyquinonedibenzoyl-methylacetal:' by C. L. JACKSON and H. A. TORREY.

J. ELLIOTT GILPIN.

Appleton's Popular Science Monthly for May gives as a frontispiece a portrait of Professor Russell M. Chittenden, the eminent physiological chemist of Yale University, together with a sketch of his life and work. There is an elaborately illustrated article on 'Kite Flying in 1897,' by Mr. George J. Varney, based chiefly on the work of the Blue Hill Observatory. Dr. J. W. Spencer contributes an article on 'The West Indian Bridge between North and South America;' Dr. H. Carrington Bolton an article entitled 'A Relic of Astrology,' and Messrs. W. H. Beatley and G. H. Perkins an illustrated study of snow crystals. There are further two articles on the study of children and two on economic subjects.

McClure's Magazine for May devotes an article to John Milne, the author being Mr. Cleveland Moffett. There are numerous illustrations, including a portrait of Professor Milne, of his house at the Isle of Wight, and of seismographs and seismograms. Many details are given regarding the earthquake observatory and Professor Milne's experiences, put largely in the form of an interview.

SOCIETIES AND ACADEMIES.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

April 19. Mr. F. J. KEELEY exhibited microscopic preparations of jade from Mexico. The mineral resembles nephrite and is therefore merely a variety of serpentine.

Mr. H. A. PILSBRY described the radula of *Nerita peloronta*. It is over two inches long and is in extreme disproportion to the small snail bearing it. Types of rhipidoglossate and other radulæ were described. He regarded the radula of cephalopods not so much as a rasp as a help to swallowing food. In *Limnea* and other gastropods it certainly acts as a rasp. In *Bulla* and other Tectibranchs the structure of the gizzard makes rasping function of the radula comparatively unnecessary.

Mr. D. S. HOLMAN made a communication on the keeping of aquaria and described filaments of Spirochætæ an inch or so in length occurring in a pellicle on the surface of a tank partially shaded from the sun.

The PRESIDENT exhibited a pearl from a little neck clam. It is about $\frac{5}{8}$ of an inch in diameter, the shades of color resembling an eye, the optic nerve being suggested by a projection at the back. The inside of the shell was devoid of coloring matter.

April 26th. Dr. A. F. WITMER made a communication on the training of chronic epileptics, dwelling on the pathology of the disease and the advantages derived from fixing the attention by means of work on perforated embroidery cards with colored silks.

Dr. BENJAMIN SHARP spoke of rock carvings occurring on the west side of Kauai, one of the Sandwich Islands. The carvings are on rocks usually covered to a considerable height with beach sand and can only be seen when de-